

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
:
ROBERT H. WOLLENBERG ET AL. : Attorney Docket No.: T-6074
:
Serial No. 10/672,721 : GROUP ART UNIT 1714
:
Filed: September 26, 2003 : EXAMINER: CALLIE E. SHOSHO
:
For: PROCESS FOR MAKING :
GROUP II METAL OVERBASED :
SULFURIZED ALKYLPHENOLS :

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AMENDMENT AND RESPONSE UNDER 37 CFR 1.111

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

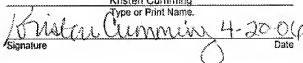
Madam:

This is in response to the Office Action mailed March 24, 2006, for which a three-month shortened statutory period for response was set.

Amendments to the Specification beginning on page 2 of this paper.

Remarks/Arguments beginning on page 15 of this paper.

I hereby certify that this correspondence is being sent via electronically to the United States Patent and Trademark Office, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 20, 2006.

Kristen Cumming
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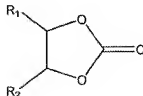
Amendment to the Claims:

Applicants respectfully request that the claims in the subject patent application be amended as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended) A process for preparing Group II metal overbased sulfurized alkylphenols which comprises:

forming a reaction mixture by combining a sulfurized alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an alkanol containing about 6 to about 15 carbon atoms, a Group II metal oxide, hydroxide or C_1 - C_6 alkoxide, a C_2 - C_{10} alkylene glycol and contacting with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:

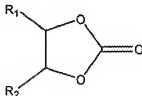


wherein R₁ and R₂ are independently hydrogen or alkyl containing one to three carbon atoms; and wherein the contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a

product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 2 (Original) The process of claim 1 wherein the sulfurized alkylphenol is a Group II metal sulfurized alkylphenate.
- Claim 3 (Original) The process of claim 1 further comprising an oil-soluble Group II metal overbased natural or synthetic hydrocarbon sulfonic acid, sulfonate, or mixtures thereof.
- Claim 4 (Original) The process of claim 1 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 5 (Original) The process of claim 4 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 6 (Original) The process of claim 5 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 7 (Original) The process of claim 1 wherein the temperature is maintained below about 215°C.
- Claim 8 (Original) The process of claim 7 wherein the temperature is maintained between 150°C and 210°C.
- Claim 9 (Original) The process of claim 1 wherein the alkyl group of the alkylene carbonate is a methyl group.

- Claim 10 (Original) The process of claim 1 wherein the alkylene carbonate is ethylene carbonate.
- Claim 11 (Original) A process for preparing Group II metal overbased sulfurized alkylphenols which comprises the steps of:
- (a) forming a reaction mixture by combining a sulfurized alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an alkanol containing about 6 to about 15 carbon atoms, a Group II metal oxide, hydroxide or C₁-C₆ alkoxide, and a C₂-C₁₀ alkylene glycol; and
 - (b) contacting said reaction mixture with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:

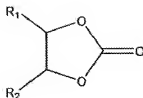


wherein R₁ and R₂ are independently hydrogen or alkyl containing one to three carbon atoms; and wherein the contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 12 (Original) The process of claim 11 wherein the sulfurized alkylphenol is a Group II metal sulfurized alkylphenate.
- Claim 13 (Original) The process of claim 11 further comprising in step (a) an oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof.
- Claim 14 (Original) The process of claim 11 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 15 (Original) The process of claim 14 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 16 (Original) The process of claim 15 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 17 (Original) The process of claim 11 wherein in step (b) the temperature is maintained below about 215°C.
- Claim 18 (Original) The process of claim 17 wherein in step (b) the temperature is maintained between 150°C and 210°C.
- Claim 19 (Original) The process of claim 11 wherein in step (b) the alkyl group of the alkylene carbonate is a methyl group.
- Claim 20 (Original) The process of claim 11 wherein in step (b) the alkylene carbonate is ethylene carbonate.

Claim 21 (Original) A process for preparing Group II metal overbased sulfurized alkylphenols which comprises the steps of:

- (a) forming a first reaction mixture by combining an alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof, and an alkanol containing about 6 to about 15 carbon atoms, the temperature of said first reaction mixture being at least about 40°C;
- (b) contacting said first reaction mixture with a second reaction mixture comprising a Group II metal oxide, hydroxide or C₁-C₈ alkoxide; a sulfurization agent and an inert hydrocarbon diluent at a temperature and for a time sufficient to effect sulfurization of the alkylphenol to form a third reaction mixture;
- (c) contacting said third reaction mixture with C₂-C₁₀ alkylene glycol to form a fourth reaction mixture; and
- (d) contacting said fourth reaction mixture with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:



wherein R₁ and R₂ are independently hydrogen or alkyl containing one to three carbon atoms; and wherein said contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 22 (Original) The process of claim 21 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 23 (Original) The process of claim 22 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 24 (Original) The process of claim 23 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 25 (Original) The process of claim 21 wherein in step (d) the temperature is maintained below about 215°C.
- Claim 26 (Original) The process of claim 25 wherein in step (d) the temperature is maintained between 150°C and 210°C.

- Claim 27 (Original) The process of claim 21 wherein in step (d) the alkyl group of the alkylene carbonate is a methyl group.
- Claim 28 (Original) The process of claim 21 wherein in step (d) the alkylene carbonate is ethylene carbonate.
- Claim 29 (Original) The process of claim 21 wherein the ratio of the alkylene carbonate to the alkylphenol is 0.6 to 1.5 weight percent.
- Claim 30 (Original) The process of claim 21 wherein the charge mole ratio of the sulfur to the alkylphenol added in step (b) is about 1.0 to about 1.7.
- Claim 31 (Original) The process of claim 30 wherein the charge mole ratio of the sulfur to the alkylphenol added in step (b) is about 1.3 to about 1.5.
- Claim 32 (Original) The process of claim 21 wherein in step (c), after contacting the third reaction mixture with a C₂-C₁₀ alkylene glycol, the temperature of the system is raised, if necessary, from that of step (b) to between about 120°C and about 190°C.
- Claim 33 (Original) The process of claim 21 wherein in step (c) the C₂-C₁₀ alkylene glycol addition is conducted at from about 100°C to about 190°C.
- Claim 34 (Original) The process of claim 33 wherein in step (c) the C₂-C₁₀ alkylene glycol addition is conducted at from 125°C to 165°C.
- Claim 35 (Original) The process of claim 21 further comprising:

- (e) heating the fourth reaction mixture of step (d) under reduced pressure to remove a portion of unreacted C₂-C₁₀ alkylene glycol and carbon dioxide.

- Claim 36 (Original) The process of claim 35 wherein step (e) is preferably conducted at from about 175°C to about 210°C.
- Claim 37 (Original) The process of claim 21 further comprising in step (a) or in step (b), or in both steps (a) and (b), the presence of a sulfurization catalyst, wherein the sulfurization catalyst is a hydrogen halide, an ammonium halide, a metal halide or 2-mercaptobenzothiozole.
- Claim 38 (Original) The process of claim 37 wherein the sulfurization catalyst is a metal halide.
- Claim 39 (Original) The process of claim 38 wherein the sulfurization catalyst is calcium chloride.
- Claim 40 (Original) The process of claim 21 wherein the alkyl group of the alkylphenol contains from about 25 to about 100 mole percent predominantly straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 75 to about 0 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.
- Claim 41 (Currently Amended) The process of claim 40 wherein the alkyl group of the alkylphenol contains from about 35 to about 100 mole percent predominantly straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 65 to

about 0 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.

- Claim 42 (Currently Amended) The process of claim 41 wherein the alkyl group of the alkylphenol contains from about 40 to about 70 mole percent ~~predominantly~~ straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 60 to about 30 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.
- Claim 43 (Currently Amended) The process of claim 42 wherein the alkyl group of the alkylphenol contains approximately 50 mole percent ~~predominantly~~ straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and approximately 50 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.
- Claim 44 (Original) The process of claim 21 wherein the alkyl group of the alkylphenol is attached predominantly at the para position of the phenol ring.
- Claim 45 (Original) The process of claim 44 wherein the alkylphenol containing the para attachment of the alkyl group is from about 70 to about 95 weight percent of the total alkylphenol.
- Claim 46 (Original) The process of claim 45 wherein the alkylphenol containing the para attachment of the alkyl group is from about 80 to about 95 weight percent of the total alkylphenol.

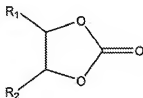
- Claim 47 (Original) The process of claim 21 wherein the alkanol contains about 8 to about 13 carbon atoms and the C₂-C₁₀ alkylene glycol is ethylene glycol.
- Claim 48 (Original) The process of claim 47 wherein the alkanol is isodecyl alcohol.
- Claim 49 (Original) The process of claim 21 wherein the hydrocarbyl group of the oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof, is an alkyl aromatic group.
- Claim 50 (Original) The process of claim 49 wherein the alkyl group of the alkyl aromatic group contains from about 6 carbon atoms to about 60 carbon atoms.
- Claim 51 (Original) The process of claim 50 wherein the alkyl group of the alkyl aromatic group contains from about 10 carbon atoms to about 40 carbon atoms.
- Claim 52 (Original) The process of claim 51 wherein the alkyl group of the alkyl aromatic group contains from about 20 carbon atoms to about 28 carbon atoms.
- Claim 53 (Original) The process of claim 21 wherein the Group II metal oxide, hydroxide or C₁-C₆ alkoxide is selected from the group consisting of calcium, barium, and magnesium oxide, hydroxide or C₁-C₆ alkoxide and mixtures thereof.
- Claim 54 (Original) The process of claim 53 wherein the Group II metal oxide, hydroxide or C₁-C₆ alkoxide is calcium hydroxide.

- Claim 55 (Original) The process of claim 54 wherein the Group II metal oxide, hydroxide or C₁-C₆ alkoxide is Dolomite comprising Ca(OH)₂.Mg(OH)₂.
- Claim 56 (Original) A product made by the process of claim 1.
- Claim 57 (Original) A product made by the process of claim 11.
- Claim 58 (Original) A product made by the process of claim 21.
- Claim 59 (Original) A product made by the process of claim 35.
- Claim 60 (Original) A product made by the process of claim 37.
- Claim 61 (Currently Amended) A detergent-dispersant additive comprising Group II metal overbased sulfurized alkylphenols, said additive being characterized by the following properties:
- (a) a color of 3.5 or lower, as measured using ASTM Test No. D 6045; and
 - (b) an increased hydrolytic stability as measured by a modified ASTM Test No. 2619 wherein the TBN of the Group II metal overbased sulfurized alkylphenols decreases less than 10 percent after dilution of the material Group II metal overbased sulfurized alkylphenols in finished marine oil to a TBN of 10 and the addition of 2.0 percent water and after 6 days at 80°C.
- Claim 62 (Currently Amended) The detergent-dispersant additive of claim 61 wherein the TBN of the Group II metal overbased

sulfurized alkylphenols decreases less than 8 percent after dilution of the material Group II metal overbased sulfurized alkylphenols in finished marine oil to a TBN of 8 and the addition of 2.0 percent water and after 6 days at 80°C.

Claims 63 (Original) A process for the in situ delivery of equimolar quantities of alkylene glycol and carbon dioxide to a reaction mixture, wherein said reaction mixture requires the presence of said alkylene glycol and said carbon dioxide as reactants, said process comprising delivering to said reaction mixture:

an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate having the following structure:



wherein R₁ and R₂ are independently hydrogen or alkyl containing one to three carbon atoms; in the presence of water; and under reaction conditions sufficient to hydrolyze the alkylene carbonate to alkylene glycol and carbon dioxide.

Claim 64 (Original) The process of claim 63 wherein the hydrolysis of the alkylene carbonate to alkylene glycol and carbon dioxide is carried out at temperatures in the range of about 150°C to about 215°C.

Claim 65 (Original) The process of claim 63 wherein the alkyl group of the said alkylene carbonate is a methyl group.

Claim 66 (Original) The process of claim 63 wherein the said alkylene carbonate is ethylene carbonate.

REMARKS

Applicants are filing this Reply and Response under 37 CFR §1.111 in response to the Examiner's Objection to missing words in Claim 1, Claim Rejections under 35 U.S.C. § 112 of Claims 1-62 and Claim Rejections under 35 U.S.C. § 102(b) of Claims 63-66.

Claim Objections

The Examiner has objected to Claim 1 because of the following informalities: words appear to be missing in line 7 after "and", and has required appropriate correction.

Applicants apologize for the typographical error and Applicants have made the appropriate correction by addition of the missing word "contacting" after the word "and" in line 7. Support for the addition of the missing word "contacting" is provided in original Claims 11(b) and 21(d), which are alternate claims for the process of Claim 1. Similarly, support is also found on page 12, lines 4-12 and page 16, lines 10-21 of the description. Applicants submit that the cited claims and the pages and line numbers are evidence that Applicants intended to include the word "contacting" in line 7, which would have appeared after the word "and", but for Applicants' typographical error.

Claim Rejections – 35 USC § 112

Claims 1-62 are rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner states:

- (a) Claim 1 recites the limitation "the contacting" in the second line after the formula. There is insufficient antecedent basis for this limitation in the claim.

Applicants submit that Applicants' amendment to Claim 1 to include the word "contacting" after the word "and" provides sufficient antecedent basis for the limitation "the contacting" in the second line after the formula and obviates the Examiner's rejection.

- (b) Claim 1 recites "reacting equivalent" line 4 after the formulas. The scope of the claim is confusing because it is not clear what is meant by this phrase or what materials are encompassed by this phrase. While it is noted that page 23, lines 24-25 of the present specification discloses that "reacting equivalent" means any materials equivalent to the ethylene glycol and carbon dioxide such as carbonic acid half ester, the scope of the claim is still confusing because it is not clear what is meant by equivalent to ethylene glycol and carbon dioxide.

Similar confusion arises in Claims 11 and 21 which each also recite "reacting equivalents."

Applicants submit that the term "reacting equivalent" is a term of art in quantitative chemistry and a person of ordinary skill in the art would understand applicants' use of term. In quantitative chemistry the term is generally used to denote a chemical compound as a functional equivalent of another chemical compound in a particular chemical reaction. The term as used presently is intended to encompass chemical equivalents of ethylene glycol and carbon dioxide, i.e. any chemical compound whose chemical reaction would be equivalent to the chemical reaction of ethylene glycol and carbon dioxide combined. Thus, chemical compounds that are equivalent to ethylene glycol and carbon dioxide are those that could replace ethylene glycol and carbon dioxide in a chemical reaction

requiring the presence of both ethylene glycol and carbon dioxide for carrying out the chemical reaction.

Applicants have used the term because, as explained in the specification on pages 24-30, the reaction mechanism for the present overbasing process for alkylphenols using alkylene carbonate is not well understood. As further explained on page 28, lines 1-14, it is predicted that the carbonic acid half ester is an intermediate in the overbasing reaction. *Since the mechanism given on page 28 is a prediction*, Applicants' must resort to using the term "reacting equivalent" to claim their invention in the broadest sense.

- (c) Claim 32 discloses that the temperature of the system is raised "if necessary". The scope of the claim is confusing because it is not clear what is meant by "if necessary" or when it would be necessary to raise the temperature. Clarification is requested.

Claim 32 refers back to independent Claim 21 where in step (c) the third reaction mixture is contacted with C₂-C₁₀ alkylene glycol to form a fourth reaction mixture. Claim 32 is further limiting step (c) by requiring that if the temperature of the fourth reaction mixture after contacting the third reaction mixture with C₂-C₁₀ alkylene glycol is not between about 120°C and 190°C, then the temperature of the system should be raised. Thus, the "if necessary" means if the temperature is not between about 120°C and 190°C, it is necessary to raise the temperature to between about 120°C and 190°C. Applicants submit that the use of the phrase "if necessary" is clear and not confusing since it is followed by clear instructions on what the desired temperature range should be and would be understood as such by a person of ordinary skill in the art.

Furthermore, the temperature requirement in Claim 32 is in accordance with those in Example 1 in the specification.

- (d) Claim 35 recites heating the fourth reaction mixture of step (d) under "reduced pressure". The scope of the claim is confusing because it is not clear what is meant by "reduce pressure" or what pressures this encompasses.

Applicants submit that the use of "reduced pressure" in step (d) recited in Claim 35 to remove some of the unreacted C₂-C₁₀ alkylene glycol and carbon dioxide from the fourth reaction mixture is not confusing and is clear because a person of ordinary skill in the art of preparing overbased sulfurized alkylphenols would know how to remove unreacted C₂-C₁₀ alkylene glycol and carbon dioxide under reduced pressure, since their removal is already known in conventional processes for preparing overbased sulfurized alkylphenols. In addition, in Example 1, page 32, lines 5-9, the pressure range given for removal of unreacted C₂-C₁₀ alkylene glycol and carbon dioxide is increasing the vacuum from 730 mm Hg to 30 mm Hg and holding at 30 mm Hg for 30 minutes before collecting the product.

- (e) Claims 40-43 each recite "predominantly straight chain alkyl groups". The scope of the claim is confusing because it is not clear what is meant by "predominantly" or what types of straight chain alkyl groups are considered "predominantly" straight chain.

Applicants have deleted the word "predominantly" used before the words "straight chain alkyl groups" in Claims 40-43 because its use is confusing. Applicants agree with the Examiner that the use of the word "predominantly" used before the words "straight chain alkyl groups" in Claims 40-43 in conjunction with specific ranges for both the straight chain alkyl groups and the branched chain alkyl groups is redundant. Since the ranges for both the straight chain alkyl groups and the branched chain

alkyl groups are given in each of Claims 40-43, it is unnecessary to include the word "predominantly". In the case of Claim 43, the use of the word "predominantly" contradicts the 50:50 mole percent straight chain alkyl groups and branched chain alkyl groups contained in the alkylphenol.

- (f) Claim 44 recites that the alkyl group is "attached predominantly" at the para position of the phenol ring. The scope of the claim is confusing because it is not clear what is meant by "attached predominantly". Clarification is requested.

Applicants submit that the use of the words "attached predominantly" in conjunction with attachment of the alkyl group to the phenol ring merely means that a predominant number of the alkyl groups are attached to the phenol ring at the position para to the hydroxyl group on the phenol ring. This is customary usage of the words and a person of ordinary skill in the art would understand it as such. Dependant Claims 45 and 46 further limit the limitation in Claim 44. Claim 45 recites that about 70 to about 95 weight percent of the alkylphenol has para attachment of the alkyl group of the total alkylphenol and Claim 46 recites that about 80 to about 95 weight percent of the alkylphenol has para attachment of the alkyl group of the total alkylphenol. A person skilled in the art would understand that more alkyl groups are attached at the para position on the phenol ring than those on the other remaining positions, ortho and meta positions.

- (g) Claim 61 recites the limitation "the material" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Applicants have amended Claim 60 to delete the word "material" in line 9 and to replace it with the words "Group II metal overbased sulfurized alkylphenols" to correct the lack of antecedent basis for the word "material". Similarly, Applicants have amended Claim 62 to delete the word "material" in line 9 and to replace it with the words "Group II metal

overbased sulfurized alkylphenols" to correct the lack of antecedent basis for the word "material". Support for the amendments is found in the specification on page 20, lines 12-20.

Claim Rejections - 35 USC § 102

Claims 63-66 are rejected under 35 USC § 102(b) as being anticipated by Kwabe et al. (U.S. 6, 187,972).

The Examiner has stated:

Kwabe et al. disclose process for in situ delivery of equimolar quantities of alkylene glycol and carbon dioxide to a reaction mixture wherein the process comprises delivering to the mixture alkylene carbonate such as ethylene carbonate including that comprising methyl group in the presence of water wherein the alkylene carbonate hydrolyzes at temperature of 50-200°C to produce alkylene glycol and carbon dioxide (col. 2, lines 21-25 and 31-33, col. 4, lines 10-47, col. 5, lines 52-62, and col. 6, lines 49-51).

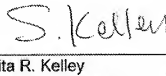
In light of the above it is clear that Kwabe et al. anticipate the present claims.

Applicants submit that Applicants' Claims 63-66 are not anticipated by Kwabe et al. because Kwabe et al. does not disclose or teach the process claimed in Claims 63-66. Kwabe et al. teaches "... a process for producing an alkylene glycol, which is a continuous process for producing an alkylene glycol comprising the following steps (1) to (4), ...". See column 2, lines 19-21. In step (2) of the Kwabe et al. process the alkylene carbonate prepared in step (1) is hydrolyzed to obtain the aqueous alkylene glycol. Kwabe et al. neither disclose nor teach the process in Applicants' Claims 63-66, wherein the process is for the "... *in situ delivery of equimolar quantities of alkylene glycol and carbon dioxide to a reaction mixture, wherein said reaction mixture requires the presence of said alkylene glycol and said carbon dioxide as reactants, ...*" See Claim 63. A

process for preparing alkylene glycol is not comparable to the elements necessary to carry out the process claimed in Claims 63-66. Claims 63-66 have essential elements of (1) in situ delivery of equimolar quantities of alkylene glycol and carbon dioxide to a reaction mixture and (2) said reaction mixture requires alkylene glycol and carbon dioxide as reactants. These elements are not anticipated by Kwabe et al., which is only disclosing a process for preparing alkylene glycol from alkylene carbonate. There is no disclosure of how the alkylene glycol could be used, i.e. as reactants in a reaction mixture. In order to be anticipatory a single reference must disclose all essential elements of the claims, which Kwabe et al. fail to do. Thus, Kwabe et al. cannot anticipate the process claimed in Applicants' Claims 63-66.

For the foregoing reasons, it is submitted that Applicants' amended Claims 1-62 particularly point out and distinctly claim the subject matter which Applicants regard as their invention. As submitted above, Applicants' Claims 63-66 are not anticipated by Kwabe et al. because Kwabe et al. fail to disclose Applicants' process in Claims 63-66. Accordingly, allowance of amended Claims 1, 41-43, 61 and 62, and original Claims 2-40, 44-66 is respectfully requested.

Respectfully submitted,



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Enclosures
April 20, 2006